

REMARKS

Reconsideration and allowance of the subject application are respectfully requested. Claims 1-4, 6-8, 11-12, and 16-38 are pending. Claims 1, 3, 11, 12, 19, 21, 22, 23, 24 and 27 have been amended. Claims 1, 3, 11, 12, 19, 27, and 31 are independent. Reconsideration of this application, as amended, is respectfully requested.

Drawings

Figs. 1 and 2 stand objected to for lacking legends indicating that only that which is old is illustrated. A legend --Conventional Art-- has been added to both Figs. 1 and 2 to overcome this objection. This legend indicates that the disclosed art is not a part of the invention. Contrary to the suggestion made in the Office Action, Figs. 1 and 2 have not been described as prior art because they do not necessarily satisfy the definition of art under 35 U.S.C. §102 that would make them "Prior Art."

Applicant respectfully requests that the Examiner withdraw this objection to the drawings.

Also, in Fig. 3, inputs to buffer 224 have been changed from L11 and L12 to E11 and E12, respectively. Support is provided on page 22, lines 7-8 of the specification.

Applicant respectfully requests that the Examiner accept this change to the drawings.

A Drawing Change Authorization Request has been filed concurrently herewith to address each objection to the drawings.

Claim Objections

The Examiner has objected to claims 22, 23 and 24 because of several informalities. In order to overcome this objection, Applicant has amended these claims as necessary to correct the deficiencies pointed out by the Examiner. Reconsideration and withdrawal of this objection are respectfully requested.

Examiner Interview

Applicant wishes to thank the Examiner for the courtesies extended to Applicant's representative during the personal interview which was conducted on June 28, 2000. During the interview, Applicant's representative secured agreement from the Examiner to withdraw the finality of the Office Action mailed on April 26, 2000, and to reconsider the application claims, because neither the Fowler or Marcade reference teaches a "bi-directional data signal line" or "determine the right of transmission" or "a serial communication line through a hole of a hinge in the appliance door".

Rejection Under 35 U.S.C. § 112, 2nd Paragraph

Claim 21 stands rejected under 35 U.S.C. § 112, 2nd Paragraph. This rejection is respectfully traversed.

The Examiner has set forth certain instances wherein the claim language is not clearly understood.

In order to overcome this rejection, Applicant has amended claim 21 to correct the deficiency specifically pointed out by the Examiner. Applicant respectfully submits that claim 21, as amended, particularly points out and distinctly claims the subject matter which Applicant regards as the invention. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Rejections Under 35 U.S.C. §102

Claims 11, 12, 16 and 19-30 stand rejected under 35 U.S.C. §102(a) as being unpatentable over U.S. Patent No. 5,555,189 to Yamazato et al. (Yamazato). This rejection is respectfully traversed.

Claim 11

Yamazato discloses (see Fig. 10) a terminal unit 60, which is removably secured to the connector 50. The terminal unit 60 is provided with a communication-use interface circuit 61 (I/F circuit) for bidirectional communications with the main control section 20, a key board 62 for **instructing the main control unit 20 to transmit various data**, and a display 63 (display means) for displaying various data transmitted from the main control section 20, and a printer 64 (printing means) for printing the above data on a recording material (see Yamazato, Col.25, lines 28-39).

A prominent feature of Yamazato, is that the terminal 60, rather than the main control unit 20, initiates the request or process that results in display of

① { information on the display unit. In other words, the display unit is not under the control of main control unit 20, but rather, main unit 20 is under the control of the display unit. Data is not displayed unless a request is made from the display unit itself. Therefore, Yamazato does not teach converting, into serial data, a signal indicative of an operation state of the refrigerator when the data transmission right is assigned to the control unit and transmitting said serial data for display without a request having been initiated from the display device, as recited in independent claim 11, as amended. Reconsideration and withdrawal of this art grounds of rejection are respectfully requested.

Claims 12, 16 and 19-30

1a { Yamazato discloses serial transmission of messages between sub-control sections 25 and main control section 20. The process cannot absolutely prevent collision of messages during serial transmission, therefore employs a system for detecting collisions of serially transmitted data, and retransmission of data due to the occurrence of the collisions (see Yamazato, Col.43, line 50-Col.44, line 14), as extensively quoted below:

In the above case, at the timing designated by A in FIG. 26(a) through FIG. 26(b), the sub-control section 25a completes the transmission of the mark 82 of 12 bits. Then, the sub-control section 25a turns ON the serial output buffer 92 so as to set the communication-use cable 36 for transmitting the start bit 87 of low level. On the other hand, at the timing A, the mark 82, of 14 bits is being transmitted by the sub-control section 25c, and it reads the state of the communication-use cable 36 (S 113). As a result, the sub-control section 25c confirms that the communication-use cable 36 is at low level although the serial

output buffer 92 is set OFF (S 114). Therefore, the sub-control section 25c detects that the collision has occurred among the message transmitted therefrom and the messages transmitted from other sub-control sections 25 in the communication-use cable 36, and immediately stops the transmission of the message (S 115). Then, the sub-control section 25c is set in the wait state until the null state 81 of the communication-use cable 36 lasts for 14 bits (S 111). Namely, the communication-use cable 36 is set wired OR by the resistor 32c in each sub-control section 25 as shown in FIG. 20.

On the other hand, the sub-control section 25a which has completed the transmission of the mark 82 of the specified length without detecting the collision among the messages transmitted therefrom and the messages transmitted from other sub-control sections 25 (S 116), can continue the transmission of the message (S 117, S 118, and S 119). Therefore, for a plurality of sub-control sections 25 to be connected to the communication-use cable 36, by setting the respective lengths of the marks 82 to be different from one another, the collision among the messages can be detected while the marks 82 are being transmitted.

Yamazato, Col. 43, line 50-Col.44, line 14

(b) Therefore, Yamazato does not disclose transmitting, if it is determined that there is data to be transmitted, the data when there is a data transmission right assigned without determining whether data collisions have occurred, as recited in independent claim 12, and similarly stated in independent claims 19 and 27, as amended.

Claims 16 and 20-26 and 28-30 depend, either directly or indirectly, on independent claims 12, 19 and 27, therefore are patentable for at least the reasons stated with respect to independent claims 12, 19 and 27.

Reconsideration and withdrawal of this art grounds of rejection are respectfully requested.

Rejection Under 35 U.S.C. 103**Claims 1-4, 6, 8, 17 and 18**

Claims 1-4, 6, 8, 17 and 18 stand rejected under 35 U.S.C. 103(a) over Yamazato, in view of U.S. Patent No. 4,646,528 to Marcade et al. (Marcade).

This rejection is respectfully traversed.

Yamazato discloses (see Fig. 10) a terminal unit 60, which is removably secured to the connector 50. The terminal unit 60 is provided with a communication-use interface circuit 61 (I/F circuit) for bidirectional communications with the main control section 20, a key board 62 for **instructing the main control unit 20 to transmit various data**, and a display 63 (display means) for displaying various data transmitted from the main control section 20, and a printer 64 (printing means) for printing the above data on a recording material (see Yamazato, Col.25, lines 28-39). A prominent feature of Yamazato, is that the terminal 60, rather than the main control unit 20, initiates the request or process that results in display of information on the display unit. In other words, the display unit is not under the control of main control unit 20, but rather, main unit 20 is under the control of the display unit. Data is not displayed unless a request is made from the display unit itself. Therefore, Yamazato does not teach a control unit for initiating and generating a display control signal, as recited in independent claim 1 (as amended), and similarly stated in independent claim 3, as amended.

Marcade, having no control unit comprising a separate entity from a display unit, cannot fill this vacancy. Claims 2, 4, 6, 8, 17 and 18 depend on independent claims 1 and 3. Since neither Yamazato, nor Marcade, discloses or suggests a control unit for initiating and generating a display control signal, Yamazato, in view of Marcade, cannot render claims 1-4, 6, 8, 17 and 18 obvious to one of ordinary skill in the art. Reconsideration and withdrawal of this art grounds of rejection are respectfully requested.

Claim 7

Claim 7 stands rejected under 35 U.S.C. 103(a) over Yamazato, in view of Marcade, as applied to claim 8, and further in view of U.S. Patent No. 4,821,530 to Ledbetter. This rejection is respectfully traversed.

Yamazato and Marcade, argued above with respect to independent claims 1 and 3, fail to disclose or suggest a control unit for initiating and generating a display control signal. Ledbetter cannot fill this vacancy. Claim 7 depends on claim 3. Since neither Yamazato, nor Marcade, nor Ledbetter discloses or suggests a control unit for initiating and generating a display control signal, Yamazato, in view of Marcade, and further in view of Ledbetter, cannot render claim 7 obvious to one of ordinary skill in the art. Reconsideration and withdrawal of this art grounds of rejection are respectfully requested.

Claims 31-36

Claims 31-36 stand rejected under 35 U.S.C. 103(a) over Yamazato, in view of Marcade and Ledbetter. This rejection is respectfully traversed.

Yamazato discloses (see Fig. 10) a terminal unit 60, which is removably secured to the connector 50. The terminal unit 60 is provided with a communication-use interface circuit 61 (I/F circuit) for bidirectional communications with the main control section 20, a key board 62 for **instructing the main control unit 20 to transmit various data**, and a display 63 (display means) for displaying various data transmitted from the main control section 20, and a printer 64 (printing means) for printing the above data on a recording material (see Yamazato, Col.25, lines 28-39). A prominent feature of Yamazato, is that the terminal 60, rather than the main control unit 20, initiates the request or process that results in display of information on the display unit. In other words, the display unit is not under the control of main control unit 20, but rather, main unit 20 is under the control of the display unit. Data is not displayed unless a request is made from the display unit itself. Therefore, Yamazato does not teach a control unit mounted on a body of said appliance for initiating display of data without a request for data from said user interface unit, as recited in independent claim 31, as amended. Marcade cannot fill this vacancy.

Claims 32-36 depend on claim 31. Since neither Yamazato, nor Marcade discloses or suggests the features of independent claim 31, Yamazato, in view of Marcade, cannot render claims 31-36 obvious to one of ordinary skill in the art. Reconsideration and withdrawal of this art grounds of rejection are respectfully requested.

CONCLUSION

For the foregoing reasons, Applicant respectfully requests the Examiner to withdraw all of the objections and rejections.

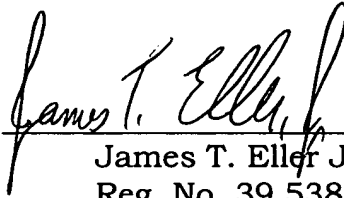
Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), the Applicant respectfully petitions for a one (1) month extension of time for filing a response in connection with the present application and the required fee of \$110.00 is attached herewith.

Should there be any outstanding matters which need to be resolved in the present application, the Examiner is respectfully requested to contact Percy L. Square (Registration No. 51,084) at (703) 205-8034, in the Washington D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment from or credit any overpayment to . Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, the extension of time fees.

Respectfully submitted,

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Attachments

VERSION WITH MARKINGS TO SHOW CHANGES MADE**IN THE ABSTRACT OF THE DISCLOSURE:**

The Abstract of the Disclosure has been amended as follows:

--ABSTRACT OF THE DISCLOSURE

An external display device of a refrigerator which includes a microprocessor enabling a serial data transmission/reception between the external display device and a control unit included in the refrigerator. The microprocessor is coupled with a second microprocessor included in the control unit by two voltage supply lines and a minimum number of data transmission lines. Data transmission/reception between the two microprocessor is carried out in an asynchronous serial manner while using an appropriate data format so that each microprocessor recognizes the operation condition of the counter microprocessor. Accordingly, it is possible to simplify the configuration of signal lines required between the external display device and control unit, irrespective of the complexity of functions required. By virtue of the simplified signal line configuration, it is possible not only to reduce [the] costs, but also to [improve] reduce the amount of work [workability] required in the passing of signal lines through a hinge hole to couple the external display device to the control unit.--

IN THE SPECIFICATION:

The paragraph beginning on page 1, line 16, has been amended as follows:

--Home electronic appliances such as refrigerators are [very] widely used by a variety of consumers having a variety of tastes. In order to satisfy such [various] a variety of tastes of consumers, manufacturers of such home electronic appliances manufacture appliances having multiple functions.--

The paragraph beginning on page 2, line 14, has been amended as follows:

--[Now, problems] Problems involved in conventional external display devices employed in refrigerators will now be described.--

The paragraph beginning on page 2, line 19, has been amended as follows:

--As shown in FIG. 1, the refrigerator includes sensors S1 and S2 adapted to sense the temperature of a refrigerating or freezing compartment, a compressor 16 [operating for a] used in the freezing operation of the refrigerator, a fan motor 17 operatively connected to the compressor 16 and adapted to circulate cold air through the refrigerating or freezing compartment, and a defrosting heater 18 adapted to remove frost formed before and after the freezing operation.--

The paragraph beginning on page 5, line 17, has been amended as follows:

--[Now, a signal] Signal processing operation of the external display device having the above-mentioned configuration will now be described.--

The paragraph beginning on page 5, line 20, has been amended as follows:

--The light emitting operation of the light emitting elements LED1 to LEDn based on data output from the microprocessor 12 will be [first] described first.--

The paragraph beginning on page 5, line 23, has been amended as follows:

--When the microprocessor 12 receives signals from the sensor S1 and S2 indicative of the temperature of a refrigerating or freezing compartment, it determines the state of the refrigerator, and then controls operations of the compressor 16, fan motor 17 and defrosting heater 18 in accordance with an appropriately set program.--

The paragraph beginning on page 7, line 3, has been amended as follows:

--Now, a signal transmission procedure will be described which [proceeds from] initiates the point of time when the user manipulates an optional key on the external display device 20 to when the microprocessor 12 of the control unit 10 detects the selected key.--

The paragraph beginning on page 8, line 25, has been amended as follows:

--As shown in FIG. 2[], the signal lines L1 to L12, which are used to transmit signals between the control unit 10 mounted in the refrigerator body and the external display device 20 attached to the outer surface of the refrigerator door, extend through the hinge hole 31 of the hinge 30. In such a configuration, an increase in the number of signal lines results in a difficulty in inserting those signal lines into the hinge hole 31. Furthermore, the limited size of the hinge hole 31 limits the number of signal lines that can be inserted into the hinge hole 31. This results in a limitation in the quantity of data [to] that can be displayed on the external display device 20.--

The paragraph beginning on page 9, line 11, has been amended as follows:

--Where the external display device 20 is spaced apart from the control unit 10 by a great distance, signal lines having a great length must be used. This results in an increase in [the] manufacturing costs.--

The paragraph beginning on page 9, line 18, has been amended as follows:

--Therefore, an object of the invention is to provide an external display device of a refrigerator having a configuration capable of achieving a desired data transmission while using a minimum number of signal lines, having a minimum length, and a method for controlling the external display device.--

The paragraph beginning on page 21, line 3, has been amended as follows:

--In order to achieve [a] data transmission between the control unit 100 and external display device 200 through the single signal line L111, an additional signal processing procedure is used, as compared to the conventional configuration. That is, the data transmission according to the present invention is carried out by transmitting an information display command from the first microprocessor 112 to the second microprocessor 221 and then transmitting information from the first microprocessor 112 to the external display device 200 to display the information under the control of the second microprocessor 221.--

The paragraph beginning on page 25, line 22, has been amended as follows:

--FIG. 5A is a flow chart illustrating the procedure for selectively assigning the right of data transmission to the first and second microprocessors of FIG. 3 in accordance with the first embodiment of the present invention.--

The paragraph beginning on page 26, line 7, has been amended as follows:

--When it is determined at step 301 that a transmission request flag is set in the subject microprocessor, the subject microprocessor is maintained in

the current state, namely, in the transmission mode, because the subject microprocessor is currently executing [a] data transmission to the counter microprocessor in a serial interrupt mode as shown in FIG. [5B] 5C.--

The paragraph beginning on page 27, line 10, has been amended as follows:

--The subject microprocessor then sets a transmission request flag informing the counter microprocessor of a data transmission from the subject microprocessor[()] (Step 323). The subject microprocessor subsequently sets a transmission mode (Step 325). After setting the transmission mode, the subject microprocessor executes a transmission mode operation in the serial interrupt mode as shown in FIG. [5B] 5C.--

The paragraph beginning on page 28, line 24, has been amended as follows:

--When the subject microprocessor is set to its transmission mode at step 315 or 325, the data stored in the buffer set at step 311 or 321 is transmitted to the counter microprocessor. This data transmission is carried out in the serial interrupt mode shown in FIG. [5B] 5C. This will be described in detail hereinafter.--

The paragraph beginning on page 32, line 11, has been amended as follows:

--FIG. [5B] 5C is a flow chart illustrating direct data transmission and reception carried out between the first and second microprocessors shown in FIG. 3.--

The paragraph beginning on page 32, line 14, has been amended as follows:

--The procedure shown in FIG. [5B] 5C is carried out under the condition in which a right of data transmission is assigned to the subject microprocessor in accordance with the procedure of FIG. [5A] 5B.--

IN THE CLAIMS:

The claims have been amended as follows:

1. (Twice Amended) An external display device of a refrigerator comprising:

a control unit for initiating and generating a display control signal, adapted to control a display operation, and converting said display control signal into serial data, and outputting the converted display control signal;

a display unit mounted on an outer case of the refrigerator, the display unit decoding a display control signal, initiated and generated from said control unit, and applied to said display unit, thereby executing a display operation;

a bi-directional data signal line adapted to transmit data between the display unit and the control unit in a serial manner.

3. (Twice Amended) An external display device of a refrigerator comprising:

a display unit mounted on an outer case of the refrigerator, the display unit recognizing a key input and converting the recognized key input into serial data, while decoding a display control signal indicative of an operating state of the refrigerator, and executing a display operation based on the decoded signal;

a control unit, initiating and generating said display control signal, converting said display control signal into serial data, and outputting the converted display control signal, the control unit also decoding a key signal received from the display unit and executing a control operation based on the decoded key signal; and

a bi-directional data signal line adapted to transmit data between the display unit and the control unit in a serial manner.

11. (Twice Amended) A method for controlling an external display device of a refrigerator adapted to display an operating state of the refrigerator while enabling a key selection for controlling the refrigerator, comprising:

determining whether a right of data transmission is assigned to the external display device or to a control unit of the refrigerator;

converting, into serial data, a signal indicative of an operation state of the refrigerator when the data transmission right is assigned to the control unit and transmitting said serial data for display without a request having been initiated from the display device;

converting, into serial data, a key input signal when the data transmission right is assigned to the external display device, transmitting said [;outputting the resultant] serial data to said control unit; and

decoding [the resultant] said serial data, and executing a control based on the decoded data.

12. (Twice Amended) A method for controlling an external display device, comprising:

determining whether or not there is data to be transmitted without determining whether data collisions have occurred;

checking whether or not a right of data transmission is assigned;[and]

transmitting, if it is determined that there is data to be transmitted, the data when there is a data transmission right assigned without determining whether data collisions have occurred; and

executing a procedure for requesting the data transmission right when there is no data transmission right to avoid having to determine whether collisions of data have occurred.

19. (Amended) A method for a first unit of a refrigerator to transmit a request to a second unit of a refrigerator, comprising:

(a) determining if said first unit is in a data transmission mode without determining whether collisions of data have occurred;

(b) determining if there is data to be transmitted if, in step (a), it is determined that said first unit is not in said data transmission mode;

(c) determining if said first unit has a data transmission right if, in step (b), it is determined that said first unit has said data to be transmitted; and

(d) transmitting said data to said second unit if, in step (c), it is determined that said first unit has said transmission right without determining whether collisions of data have occurred.

21. (Amended) The method of claim 19, further comprising:

(e) determining if said first unit has a data transmission right if, in step (b), it is determined that said first unit [has] does not have said data to be transmitted;

(f) determining if said data transmission right should be assigned to said first unit if, in step (e), it is determined that said first unit has said data transmission right; and

(g) transmitting said data to second unit if, in step (f), it is determined that said first unit should be assigned said transmission right.

22. (Amended) The method of claim 19, further comprising:

(h) determining whether [data from] said first unit received data from said second unit;

(i) determining if said first unit has a data transmission right if, in step (h), it is determined that said first unit received data from said second unit;

(j) storing said data received from said second unit if, in step (i), it is determined that said first unit has a data transmission right;

(k) determining if further data is to be transmitted from said first unit to said second unit; and

(l) continuously executing communication if, in step (k), it is determined that further data is to be transmitted from said first unit to said second unit.

23. (Amended) The method of claim 22, further comprising:

(m) determining if said second processor is requesting data transmission right if, in step (k), it is determined that further data is not to be transmitted from said first unit to said second unit; and

(n) relinquishing [own] data transmission right of said first unit if, in step (m), it is determined that said second processor is requesting a data transmission right.

24. (Amended) The method of claim 22, further comprising:

(o) analyzing command received from said second unit if, in step (i), it is determined that said first unit has a data transmission right;

(p) determining if said second unit has relinquished its data transmission right; and

(q) acquiring said data transmission right if, in step (p), it is determined that said second unit has relinquished its data transmission right.

27. (Amended) A method for a first unit of a refrigerator to receive and send from and to a second unit of a refrigerator, comprising:

(a) determining if said first unit is in a reception mode without determining whether collisions of data have occurred;

(b) determining if end of transmission signal is received by said first unit if, in step (a), it is determined that said first unit is in said reception mode;

(c) receiving further data if, in step (b), it is determined that said end of transmission signal has not been received; and

(d) storing said received data.

31. (Amended) A control system for an appliance, comprising:
a user interface unit mounted on a door of said appliance;
a control unit mounted on a body of said appliance for initiating display of data without a request for data from said user interface unit; and
a serial communication line connecting said user interface unit and said control unit, said serial communication line being disposed through a hole of a hinge of said door.